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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|---|---|---|---|---|
| 09/101,083 | 07/08/1998 | SATORU MIYASHITA | 101050 | 9256 |

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| EXAMINER | |
|---|---|
| TARAZANO, DONALD LAWRENCE | |
| **ART UNIT** | **PAPER NUMBER** |
| 1773 | 32 |

DATE MAILED: 01/15/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

AS-33

| Office Action Summary | Application No. | Applicant(s) | |
|---|---|---|---|
| | 09/101,083 | MIYASHITA ET AL. | |
| | Examiner | Art Unit | |
| | D. Lawrence Tarazano | 1773 | |

-- Th MAILING DATE of this communication appears on th cov r sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☐ Responsive to communication(s) filed on 2-26-2002; 3-6-2002 .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) 1-40 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1-40 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

13)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 6,8,16,17
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

## DETAILED ACTION

### *Continued Prosecution Application*

1. The request filed on Feb 25, 2002 for a Continued Prosecution Application (CPA) under 37 CFR 1.53(d) based on parent Application No. 09/101,083 is acceptable and a CPA has been established. An action on the CPA follows.

### *Claim Rejections - 35 USC § 103*

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 1-3, 5-15, 17-40 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shirasaki et al. (5,895,692).

Shirasaki et al. teach electroluminescent devices (column 4, lines 35+). As shown in figure 1 below: The structure comprises a transparent substrate (11), transparent pixel electrodes (12), a luminescent layer (13) comprising a poly-N-vinylcabazole (PVCZ) matrix having color pixels (13a, b, c), which had been printed by ink jet or other means and then diffused, into the polymer matrix. The devices also have an electron injection layer (14) deposed over the luminescent layer and a second set of electrodes (15).

FIG.1

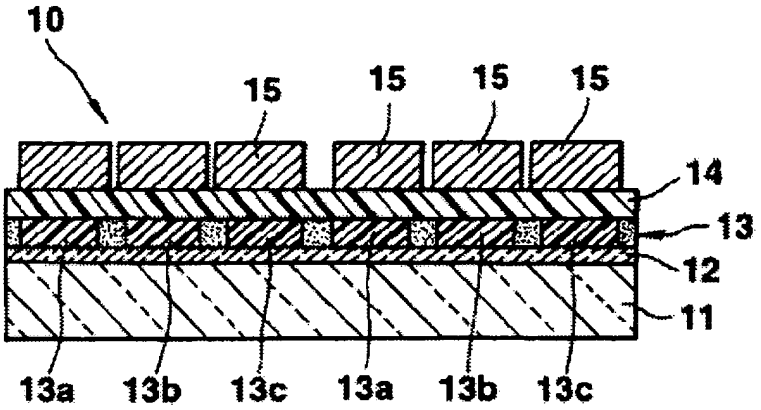
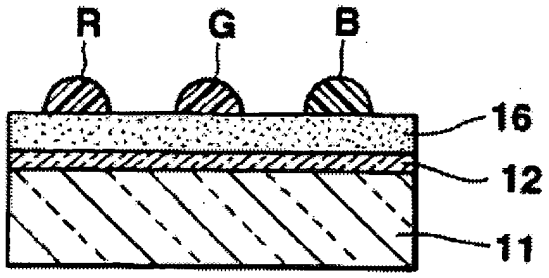



Figure 7B show the R (Red), G (Green) and B (Blue) pixels being formed on the surface of the luminescent hole transport layer (16), by a lithographic (coating) or ink jet method (column 7, lines 14+). These pixels represent discontinuous non-overlapping layers and meet the requirement that there are three colored layers

FIG.7B




These pixels have predetermined shape when printed, and this relates to the dot shape of the pixels in the final product. While a diffusion step occurs in the formation of the structures, this does not detract from the fact that the shape of the printed pixel is the shape of the pixel in

the final product. Regarding claim 40, because the colored pixels do not overlap, they do not build on themselves. Each layer of colored pixels covers different areas of the substrate layer. Thus, the layers applied in any order would result in the same product.

Regarding the order of layers (14), dye layer and (13), hole transfer layer It would have been obvious to one having ordinary skill in the art to have changed the order of these two layers between the electrodes (15) and (12) because the device would still function in the same capacity. The device would generate light and electrons would move between the electrodes. There in no reason to believe that the device would function materially differently from what it does now in the prior art.

Regarding claim 20, since dyes work by electron excitement, an electron in the dye would be excited and then transfer to the matrix which functions as a hole material.

Regarding claims 10 and 22, as discussed above, Shirasaki et al. teach electroluminescent devices, but they are silent regarding the use of a protective layer on top of the electrodes (15). In the art of electronics, electrodes are generally fragile and prone to deterioration; therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have included a protective layer on top of the electrodes in the structures taught by Shirasaki et al. in order to produce a more robust structure.

Regarding claims 34 and 35, the colored pixels are put down by a lithographic (coating) or ink jet method, but Shirasaki et al. are silent the order in which the colored pixels are applied. In the absence of unexpected results relating to the order of the layers, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have applied the non-overlapping colored pixels in any order, including the order claimed, since the same product would result.

4. Claims 4 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shirasaki et al. (5,895,692) in view of Nakano et al. (5,317,169).

As discussed above Shirasaki et al. teach electroluminescent devices having a luminescent layer sandwiched between two electrode layers. The light-emitting layer (13) is made of polymers such as polyvinyl carbazole, which emit light upon electronic excitation. While various polymers can be used they are silent regarding the use of materials such as polyparaphenylene vinylene.

Nakano et al. teach that materials such as polyvinyl carbazole result in structures having low luminescence (column 1, lines 54+). However, polyparaphenylene vinylene materials - $(Ar\text{-}CH{=}CH)_n$- according to Nakano et al. have excellent light emitting properties in which the films are easily formed (column 2).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have used paraphenylene vinylene materials as taught by Nakano et al. in the luminescent layer (13) of the structures taught by Shirasaki et al. in order to produce structure having improved luminescent properties.

***Response to Arguments***

5. Applicant's arguments filed 9-21-2002 have been fully considered but they are not persuasive. The applicants argue that (13 / 16) do not constitute separate layers as claimed, the examiner notes that the structure as taught in the prior art comprises an additional layer (14) which meets the claimed requirement for an additional layer. The only question to be resolved is the positioning of the two layers relative to each other. It appears that the applicants claim that the EL layer is formed on top of the additional layer and the prior art teaches the converse. However, there does not appear to be any reason why the layer could not be reversed.

***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to D. Lawrence Tarazano whose telephone number is (703)-308-2379. The examiner can normally be reached on 8:30 to 6:00 (off every other Friday).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Paul J Thibodeau can be reached on (703)-309-2367. The fax phone numbers for the organization where this application or proceeding is assigned are (703)-872-9310 for regular communications and (703)-872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703)-308-0661.

D. Lawrence Tarazano
Primary Examiner
Art Unit 1773

dlt
January 13, 2003